

REMARKS

The office action of April 4, 2008, has been carefully considered.

It is noted that claim 4 is objected to under 37 C.F.R. 1.75(c).

Claims 1-3 are objected to for containing various informalities.

Claim 4 is rejected under 35 U.S.C. 112, first paragraph.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph.

Claims 1, 4-5 and 7 are rejected under 35 U.S.C. 103(a) over the patent to Yu et al. in view of the patent to Manthey et al. '344.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) over Yu et al. and Manthey et al. '344, and further in view of the patent to Ujiie.

Claim 6 is rejected under 35 U.S.C. 103(a) over Yu et al. and Manthey et al. '344, and further in view of the patent to Coleman.

Claim 8 is rejected under 35 U.S.C. 103(a) over Yu et al. and Manthey et al. '344, and further in view of the patent to Abukawa et al.

Claims 9-12 are rejected under 35 U.S.C. 103(a) over Yu et al. and Manthey et al. '344, and further in view of the patent to Manthey et al. '243.

In view of the Examiner's objection to and rejections of the claims, applicant has canceled claim 4 and amended claims 1-3 and 7. Support for directing water laterally to the plane of the slabs can be found in the specification at page 6, lines 20-22, page 7, lines 9-10, and page 10, lines 16-18, among others.

With the cancellation of claim 4 it is respectfully submitted that the objection to this claim under 37 C.F.R. 1.75(c), and the rejections under 35 U.S.C. 112, first and second paragraphs are overcome and should be withdrawn.

With the amendments to claims 1-3 it is also respectfully

submitted that the objection to these claims as containing informalities is overcome and should be withdrawn.

It is respectfully submitted that the claims presently on file differ essentially and in an unobvious, highly advantageous manner from the methods and constructions disclosed in the references.

Turning now to the references and particularly to the patent to Yu et al., it can be seen that this patent discloses the spray quenching of metal with liquid coolant containing dissolved gas.

The patent to Manthey et al. '344 discloses a system for cooling large, hot metal slabs.

The Examiner combined these references in determining that claims 1, 4-5 and 7 would be unpatentable over such a combination. Applicant respectfully submits that neither of these references, nor their combination, teach the presently claimed invention. Both these references have been discussed at length in the last filed amendment and those comments are incorporated herein by reference. The following additional comments are provided.

Manthey et al. has essentially the same teachings as the prior art which forms the starting point of the present invention (see DE 25 48 154 discussed in the specification of the present application). Manthey et al. teach one skilled in the art to dip the slabs in an upright position completely into a water filled basin. The quenching operation tied to this is totally disadvantageous, as discussed on pages 1-2 of the specification of the present application.

In order to overcome these disadvantages, the presently claimed invention selectively sprays both sides of the slab when the slab is both below and above the level of the water in the basin.

There is no suggestion of this by Yu et al., Manthey et al. or a combination of Yu et al. and Manthey et al. Yu et al. only teach, as shown in Figs 2 and 3 and described at col. 9, lines 47-63, a cooling in a vessel filled with water, wherein water exiting via the port 14 is divided into two portions, the largest portion being directed by a conduit 22 back to the vessel in order to keep the water in the vessel circulating. A gas containing fluid is transported to the manifold system 44, 46 so that the gas contained in the fluid can be released to create a mixing flow in

the vessel 10 (see col. 9, lines 6-13). There is no teaching in Yu et al. regarding how the cooled metal articles are to be introduced into the vessel. In at least the embodiment of Figs. 2 and 3 it is not possible to stand the article/slab on end. This is prevented by the pipes 46 at the bottom of the vessel. A two-sided spraying is also not possible since the dispenser 24 with the ports 26 is provided at one elevation, and also at the top of the vessel so as to be far from the article to be cooled. According to Yu et al. the article to be cooled is not to be directly sprayed with the cooling water, rather the cooling water is to be agitated by the gas and circulate in the vessel.

The above discussion applies equally for the embodiment in Fig. 4 of Yu et al. The spray heads 60 of the feeder conduit 74 are intended to achieve a water curtain above the vessel so that an article below the plane of the water curtain can be soaked. This is clearly described at col. 12, lines 12-27, particularly lines 20-22 of Yu et al.

Thus, Yu et al. provide no teaching of directly spraying both sides of a slab with cooling water. Furthermore, Yu et al. do not teach a cooling water circulation which has means for lowering the water level from a maximum, upper water level to a low, lower

water level, as recited in claim 7 of the present application. In Fig. 4 of Yu et al., only the lower water level is possible. A maximum upper water level that fills the vessel is not within the teachings of Yu et al. The water starts in the water curtain above the vessel and then is collected and returned to the water curtain, it cannot fill the vessel. Furthermore, the water level in the basin 62 of Yu et al. cannot be changed so that the slabs are sprayed even when they are below the water level. The drain 68 prevents the possibility of the water level reaching anywhere near the feeder conduit 74 and the spray heads 60. Therefore, it would not be obvious to one skilled in the art to provide a method in which the slabs are selectively sprayed both above and below the water level in the tank by changing the water level in the tank.

The combination of references does not teach selectively spraying water laterally against the sides of slabs that have been stood on edge both above and below the water level in the cooling tank by changing the level of the water in the tank, as in the presently claimed invention.

In view of these considerations it is respectfully submitted that the rejection of claims 1, 4-5 and 7 under 35 U.S.C. 103(a) over a combination of the above-discussed references is overcome

and should be withdrawn.

As for the remaining references, they have also been considered. Applicant submits that none of these references adds anything to the teachings of the primary references so as to suggest the presently claimed invention as discussed above.

In view of these considerations it is respectfully submitted that the rejections of claims 2, 3, 6 and 8-12 under 35 U.S.C. 103(a) are overcome and should be withdrawn.

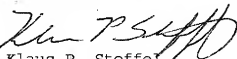
Reconsideration and allowance of the present application are respectfully requested.

Any additional fees or charges required at this time in connection with this application may be charged to Patent and Trademark Office Deposit Account No. 02-2275.

Respectfully submitted,

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